MultiModemUSB™

56K Data/Fax Modem with USB

Model MT5634ZBA-USB

Data/Fax Modem

User Guide

MultiTech® Systems

Owner's Manual

Model MT5634ZBA-USB

P/N 8310000 Revision A

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Notice

Though these modems are capable of 56K bps download performance, line impairments, public telephone infrastructure and other external technological factors currently prevent maximum 56K bps connections.

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Contents

Chapter 1 - Introduction and Description

Introduction 6
Product Description 6
Universal Serial Bus (USB) 6
What Is in Your Modem Package? 7
Related Manuals 7

Chapter 2 - Quick Start

Introduction 10
What You Will Need 10
Safety Warnings 10
Step 1: Assemble the Modem 11
Step 2: Connect the Modem to Your System 12
    USB Connection 12
    Line Connection 12
    Phone Connection 12
Step 3: Install the Modem in Windows 98 13
    Installation in Windows 95 13
    Removing Your Old Modem from Windows 95/98 14
Step 4: Call the Multi-Tech BBS 15
Step 5: Send a Fax 16
References 17

Chapter 3 - Features

What Can You Do with Your Modem? 20
Features 20
    Data 20
    Fax 21
    Required Equipment 21
    Computer 21
    Telephone Line 21
    Communications Software 21
Connections 22
    Connecting to the Computer (“USB”) 22
    Connecting to the Telephone Line (“LINE”) 22
    Connecting to a Telephone Set (“PHONE”) 22
    Surge Protectors and Lightning 22
Front Panel 23

Chapter 4 - AT Commands, S-Registers and Result Codes

AT Commands 26
AT Command Summary 27
S-Registers 36
Result Codes 39

Chapter 5 - Remote Configuration

Introduction 42
Basic Procedure 42
Setup 42
Changing the Setup Password 42
Changing the Remote Escape Character 43

Chapter 6 - Troubleshooting

Introduction 46
None of the Indicators Light 46
The Modem Does Not Respond to Commands 46
The Modem Dials But Cannot Connect 47
The Modem Disconnects While Online 48
The Modem Cannot Connect When Answering 48
The Modem Doesn’t Work with Caller ID 48
Fax and Data Software Can’t Run at the Same Time 48

Appendixes

Appendix A: Regulatory Compliance 50
Appendix B: Technical Specifications 55
Appendix C: Loopback Tests 58
Appendix D: Warranty, Service, and Technical Support 61

Index

MultiModemISB™

56K Data/Fax Modem with USB

Chapter 1 - Introduction and Description

MultiTech® Systems

Introduction

Welcome to the world of data communications. You have acquired one of the finest intelligent data and fax modems available today from one of America's oldest and most respected modem manufacturers: Multi-Tech Systems, Inc. This owner's manual will help you install, configure, test and use your modem.

Product Description

The MT5634ZBA-USB modem incorporates *V.90™* technology, which enables Internet connections at data rates up to 53K bps* over standard telephone lines. V.90 technology is able to send data downstream from the Internet to your computer at these speeds because data on the telephone network typically is converted from digital to analog only once before it reaches your modem. Upstream transmissions, and transmissions between client modems, are limited to data rates of 33.6K bps, as are downstream transmissions that are converted more than once on the telephone network.

The MT5634ZBA-USB is Plug and Play-capable, with interactive automatic dialing and command mode configuration. In standard mode, you can store up to four command lines or telephone numbers of up to 40 characters each in the modems' nonvolatile memory. The modem pulse- or tone-dials, and recognizes dial tones and busy signals for reliable call-progress detection. The modem can detect AT&T calling card tones. It also has Caller ID, remote configuration and incorporates self-resetting lightning protection. The MT5634ZBA-USB is FCC-registered for connection without notification to the telephone company.

The MT5634ZBA-USB is a full-duplex intelligent modem with V.42 error correction, V.42bis data compression, and V.17 (14,400 bps), Class 1 and 2, Group 3 fax capabilities.

Universal Serial Bus (USB)

Universal Serial Bus (USB), defined by a consortium of industry leaders, permits connection of multiple low-speed and medium speed computer peripheral devices such as telephones, modems, printers, keyboards, mice, and scanners; all from a single personal computer port. The specification, based on an open architecture is quickly becoming a standard feature in new desktop and notebook computers.

* Although K56flex technology is capable of downloads of up to 56K bps, FCC regulations currently restrict ISP modems to downloads of 53K bps.

What Is in Your Modem Package?

Your modem package has several components. Make sure you have them all before trying to operate your modem. Your package should include:

- One MT5634ZBA-USB modem
- One set of four plastic feet
- Two sets of velcro fasteners
- One modular telephone cable
- One USB cable
- One installation diskette
- This *MT5634ZBA-USB User Guide*
- *MT5634ZBA-USB Quick Start Guide*
- Trio data, fax, and voice software

If any of these items are missing, please contact Multi-Tech Systems or your dealer/distributor (see Appendix D for information on contacting Multi-Tech via telephone, fax, bulletin board service, CompuServe, and the Internet).

Related Manuals

The following manuals are available on request.

82039200 *Voice +V Commands Developer's Kit*

82076200 *MT56XX Fax Class 1 Developer's Guide*

82006501 *TR29.2 (Proposed) Class 2 Fax Command Reference Manual*

MultiModemISB™

56K Data/Fax Modem with USB

Chapter 2 - Quick Start

MultiTech® Systems

Introduction

We know you are eager to get your Multi-Tech fax modem up and running, so we'll skip the features for now, and show you step-by-step how to set it up, check it out, and make your first calls.

What You Will Need

Before starting, please make sure you have everything you need:

We supply

- An MT5634ZBA-USB data/fax modem
- One set of four plastic feet
- Two sets of hook-and-loop fasteners
- One modular telephone cable
- One USB cable
- Trio communications software
- A *Quick Start Guide*
- This *User Guide* on disk
- An installation disk

You supply

- A computer with an unused USB port
- A nearby telephone line jack

If you are new to computers, see "Chapter 3 - Features," for more information about the required equipment.

Safety Warnings

- Never install telephone wiring during a lightning storm.
- Never install a telephone jack in a wet location unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm; there may be a remote risk of electrical shock from lightning.
- Do not use a telephone in the vicinity of a gas leak.

Step 1: Assemble the Modem

The only assembly required is to mount the feet on the bottom of the modem. Simply peel the four self-adhesive plastic feet off the backing strip and press them into the recesses on the bottom of the modem. Alternately, or additionally, you can use the included self-adhesive hook-and-loop patches to mount the modem to a vertical surface or to keep it from being dislodged on a horizontal surface. If you use the hook-and-loop patches, we recommend that you mount them where they will not obscure the labels or screws on the bottom of the modem.

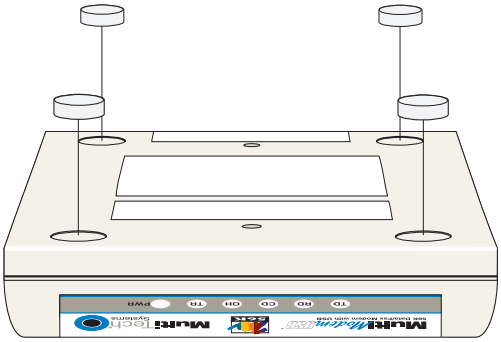

Figure 2-1. Mounting the feet.

Step 2: Connect the Modem to Your System

Placing the modem in a convenient location, connect it to your computer's USB port, to the telephone line, and, optionally, to your telephone.

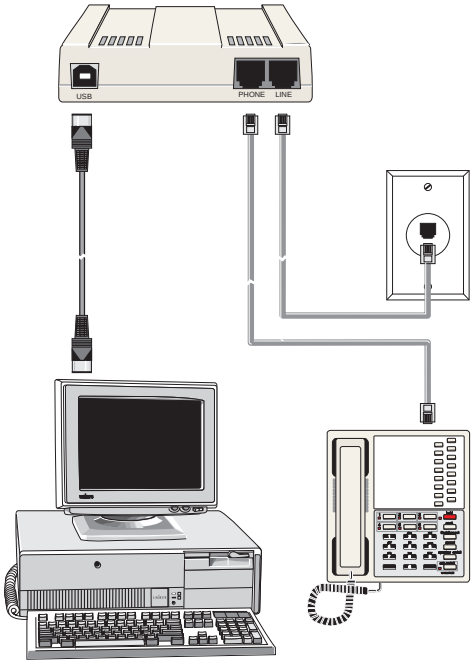

Figure 2-3. Modem connections.

USB Connection

Plug one end of the USB cable into the USB connector on the modem, and the other end into a USB port connector on your computer.

Line Connection

Plug one end of the phone cable into the modem's LINE jack, and the other end into a phone line wall jack.

Note: The LINE jack is not interchangeable with the PHONE jack. Do not plug the phone into the LINE jack or the line cable into the PHONE jack.

Note: The Federal Communications Commission (FCC), and Industry Canada impose certain restrictions on equipment connected to public telephone systems. See Appendix A for more information.

Phone Connection

For voice-only calls, you can optionally plug a telephone into the modem's PHONE jack.

Step 3: Install the Modem in Windows 98

If you are using Windows 98 you must install the modem in the operating system. (If you are using another operating system, you can skip this step.)

Adding the Modem to Windows 98

1. Power up your Windows 98 system.
2. If you have not already done so, connect one end of your USB cable to a USB connector on your PC, and connect the other end to the USB connector on your modem. The Power LED on your modem will light.
3. Windows will detect that the new modem is present and launch the **Add New Hardware Wizard**.
4. Place the Installation diskette provided with your modem into your floppy drive and click **Next** to proceed with the installation.
5. Verify that the “Search for the best driver for your device. (Recommended)” option is selected and click **Next**.
6. Verify that the “Floppy disk drives” option is selected and click **Next**.
7. Windows will select the proper driver from the installation disk and will display the information for verification. Click **Next** to install the selected driver.
8. A message will appear when Windows finishes installing the driver. Click **Finish** to complete the installation and exit the wizard. The TR LED on your modem will light when the installation is complete.

Installation in Windows 95

Only Certain versions of Windows 95 offer support for USB peripherals. If you are unsure if your Win95 system supports USB, a free USB evaluation utility is available from the Shopping Bag page at http://www.usb.org. Just download the utility (287K) and run the .exe application. It will determine if you have USB support.

If you would like to install your MT5634ZBA-USB in Windows 95, perform the following steps.

Installing in Windows 95

1. Insert the Setup disk provided with your modem into your floppy drive.
2. If you have not already done so, connect one end of your USB cable to a USB connector on your PC, and connect the other end to the USB connector on your modem. The Power LED on your modem will light.
3. Windows will detect that the new modem is present and launch the **Update Device Driver Wizard**. Click **Next** to proceed with the installation.
4. Windows searches for the driver on A:\ and, when identified, will display the driver name for verification. Click **Finish** to install the driver.
5. Windows prompts you to insert a diskette. You have already inserted the diskette, so click **OK** to continue. The **Copy Files ...** dialog is displayed. In the **Copy files from** field, choose **A:** from the drop-down list and click **OK**.
6. When the driver is installed, a completion message will appear, the TR LED on your modem will light, and the wizard will exit. At this time your installation is complete.

Removing Your Old Modem from Windows 95/98

When your new modem replaces another modem, the old modem installation remains in Windows 95/98 after you install the new modem, and the old modem is still selected in HyperTerminal and other Windows 95/98 applications. Although you can change the application connection descriptions one at a time, it is easier to force Windows applications to use the new modem by removing the old modem from Windows.

1. Click **Start | Settings | Control Panel**.
2. Double-click the Modems icon to open the **Modems Properties** sheet.
3. In the list box, select the old modem.
4. Click **Remove**, then click **Close**.
5. The next time you dial a HyperTerminal connection, it will select your new modem and ask you to confirm the selection.

Step 4: Call the Multi-Tech BBS

Test the modem's data functions by calling the Multi-Tech bulletin board system (BBS) and downloading REGISTER.DOC, if you have Microsoft Word 6.0 or 7.0, or REGISTER.TXT if you do not.

Windows 98 HyperTerminal

1. Click **Start | Programs | Accessories | Communications | HyperTerminal.**
2. Start HyperTerminal by double-clicking on the Hypertrm icon. HyperTerminal asks for the name of the connection.
3. Type **Multi-Tech BBS** in the **Name** box and click **OK**.
4. In North America, type **800** in the **Area code** box and **392-2432** in the **Phone number** box. Local and international users, type **612** in the **Area code** box and **785-3702** in the **Phone number** box.
5. Verify that your modem is selected in the **Connect using** box, then click **OK**.
6. In the **Connect** dialog box, click **Dialing Properties**.
7. Make any necessary changes in the **Where I am** and the **How I dial from this location** boxes. If you must dial *9* to access an outside line, you should type **9** in both the local and the long distance boxes unless your phone system has a special requirement.
8. Click **OK**, then click **Dial**. You will know you have reached a modem by the harsh sounds of the modem handshake.
9. When the BBS welcome screen appears in the HyperTerminal window, type your first name, last name, and password following the prompts. If you are a first-time caller, the BBS asks if your name is spelled correctly. If you answer **Y**, a questionnaire appears. You must complete the questionnaire to use the BBS on your first call.
10. Press ENTER until the main menu appears. From the main menu you have access to two areas: the Files Menu and News. For help with menu commands, type **?**.
11. In the Main Menu, type **F** and press ENTER to access the Files Menu, then type **D** and press ENTER to download.
12. At the prompt, if you have Microsoft Word 6.0 or later, type **register.doc** and press ENTER twice. If you do not have Microsoft Word, type **register.txt** and press ENTER twice.
13. Answer **Y** or **N** to the automatic logoff question.
14. Type **Z** and press ENTER to select the Zmodem transfer protocol.
15. The download begins automatically. As the file is copied to the HyperTerminal folder, a dialog box reports on the progress of the download.
16. To log off the BBS if you answered **N** in step 13, press ENTER, type **G** for "good-bye," and press ENTER twice more.
17. In the HyperTerminal window, click **File**, then click **Save** to save the HyperTerminal connection description.

Step 5: Send a Fax

To test your modem's fax capabilities, send the completed registration file that you downloaded in "Step 4: Call the Multi-Tech BBS" to Multi-Tech or to a fax machine in your office.

The following procedures require that the Trio communications software, that is included with your modem, be installed in your Windows 98 system. If you have not already done this, load the Trio CD into your CD-ROM drive and follow the on-line installation instructions.

1. Depending on which version of the registration file you downloaded, use either Microsoft Word or NotePad to open the registration file.
2. Fill out the registration form.
3. Save the file and exit Word or NotePad.
4. Select **Start | Programs | Trio Applications | Trio DataFax Voice**.
5. The **Trio DataFax Voice** dialog box is displayed. Click **Send FAX**.
6. If you are sending the registration form to your own fax machine or to another fax modem in your office, choose the proper entry from the entries list, or configure a new entry.

   If you are sending the registration form to our offices, click New Entry to create a new recipient profile.
7. The **Add New Entry** dialog is displayed. Verify that **Recipient** is selected and click **OK**.
8. The **New/Edit Recipient** dialog is displayed. Fill in the following fields:

   Name: MT5634ZBA-USB Registration
   Company: MTS
   Fax Number: 612 785-9874

   Click **OK**.
9. When you are returned to the **Send Fax** dialog, the new registration entry will appear in the entries list. Select the new entry and click **Next Dialog**.
10. The **Select Coversheet** dialog is displayed. Select **standard coversheet** from the list of available coversheets, and click **Next Dialog**.
11. The **Enter Coversheet Message** dialog is displayed. Click **Load** and then browse to the location of your completed registration form. Double click on the registration form file and it will be loaded into the message field. Click **Next Dialog**.
12. Trio displays a preview of the completed fax. If you are satisfied with the fax, click **Send** to submit the document.

    If you wish to make changes, click **Previous**. You are returned to the message dialog. When you are satisfied with the changes, click **Next Dialog | Send** to submit the document.
13. The **Trio DataFax Voice** dialog is displayed with the status of the fax is shown in the **Outgoing Messages** field.
14. Exit Trio when the message has been successfully sent.

References

The World Wide Web is an excellent source of information about modems in general and modem installation, configuration, and troubleshooting in particular. The following Web sites are good places to start:

- Costmo's Other Resources Page:
  http://modems.rosenet.net/or/
- Curt's High Speed Modem Page:
  http://elaine.teleport.com/~curt/modems.html
- Data Communications FAQ:
  http://www.best.com/~malch/comfaq.html
- Multi-Tech Systems, Inc.:
  http://www.multitech.com/

MultiModemUSB™

56K Data/Fax Modem with USB

Chapter 3 - Features

MultiTech® Systems

What Can You Do with Your Modem?

Your Multi-Tech MultiModem is the gateway to the exciting world of telecommunications.

You can use it to access commercial on-line information services such as CompuServe, America Online, Genie, and Prodigy. These services provide access to databases, encyclopedias, stock reports, news, weather, and shopping. They provide electronic mail (e-mail) links to subscribers of the same and other services. Public message areas called forums allow subscribers to trade information and opinions on a vast array of topics from A to Z, while vendor forums provide hardware and software support from Multi-Tech and other manufacturers. Online services also allow you to upload and download computer programs, data files, and updated software such as video and printer drivers.

Your modem can also connect you to the Internet, an international computer network of universities, libraries, businesses, and government agencies. Like the commercial online services, the Internet provides e-mail services, public message areas, and access to information and software, much of it easily accessed through the World Wide Web.

Other uses include direct links to colleagues with modems, to banks, and to service bureaus. You can also telecommute with your fax modem—work at home while communicating with the office by modem or fax.

And of course, you can use your modem to exchange faxes with any fax machine in the world, enabling you to communicate quickly with businesses and organizations that do not have direct modem communications.

Features

- Compliance with major ITU-T, TIA, and EIA international standards to ensure compatibility with other modems.
- Caller ID capability can identify a caller's phone number (available only on U.S. products).
- Limited warranty: Ten years

Data

- Supports the V.90 standard for data transmission speeds up to 56K bps while maintaining compatibility with lower-speed modems.
- Supports the enhanced ITU-T V.34 standard, with data transmission speeds to 33.6K bps.
- Supports asynchronous data rates at 56K, 33.6K, 31.2K, 28.8K, 26.4K, 24K, 21.6K, 19.2K, 16.8K, 14.4K, 12K, 9600, 4800, 2400, 1200, and 300 bps.
- Supports automatic fallback to slower speeds in noisy line conditions, and fall-forward to faster speeds as conditions improve.
- ITU-T V.42 LAP-M and MNP Class 3 and 4 error correction.
- ITU-T V.42bis (4-to-1) and MNP 5 (2-to-1) data compression.
- Automatically disables data compression when transferring already-compressed files.
- Autodial, redial, pulse (rotary) and touch-tone dial.
- Dial tone and busy signal detection for reliable call-progress reporting.
- Compatible with the standard AT command set used by most communication programs.

Fax

- Supports V.17, Group 3 fax communication standards, allowing it to communicate with other fax modems as well as with fax machines.
- Responds to EIA/TIA Class 1 and 2 fax commands, enabling it to exchange editable and encrypted faxes with Windows 95 computers.
- Sends and receives faxes from your computer at 14,400 bps, 9600 bps, 7200 bps, 4800 bps, 2400 bps, or 300 bps.

Required Equipment

In addition to the contents of your modem package, you need the following equipment.

Computer

Your modem can only be connected to a computer with a USB port.

Telephone Line

You must have a telephone line with jack (connector) that accepts the cable that comes with the modem. If you do not have a telephone jack near your computer, you should install one before proceeding.

Do-it-yourself telephone extension kits and accessories are available wherever telephones are sold. You may also hire an independent contractor or your local telephone company to install an extension. If you want a separate line for your fax modem, you must contact your telephone company.

Communications Software

To operate your modem, you must have data communications and fax communications software (included with the modem). Data communications software simplifies control of the modem by guiding you through the process of selecting your serial port, your port speed, and other variables, and then storing your settings, including frequently called phone numbers, so they can be recalled with the stroke of a key or the click of a mouse. Data communications software must be set up, or configured, before you can use it.

Connections

To use your modem, you must connect it to your computer (“USB”), to a telephone line (“LINE”), and optionally to a telephone set (“PHONE”).

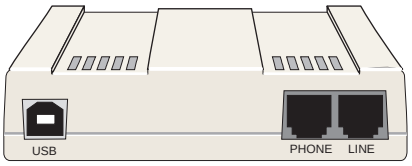

Figure 3-1. USB and communications connectors.

Connecting to the Computer (“USB”)

Using a USB cable, connect the USB connector on the modem to a USB connector on the back of your computer.

Connecting to the Telephone Line (“LINE”)

Plug one end of the cable provided with the modem into the telephone jack in your home or office. Plug the other end into the LINE jack on the modem.

Note: The LINE jack is not interchangeable with the PHONE jack. Do not plug the telephone into the LINE jack or the line cable into the PHONE jack.

Note: The Federal Communications Commission (FCC), Industry Canada, and other regulatory agencies impose certain restrictions on equipment connected to public telephone systems. See Appendix A for more information.

Connecting to a Telephone Set (“PHONE”)

If you wish to connect a telephone to the same line as the modem, you can plug it into the modem’s PHONE jack. This connector is provided as a convenience; you can also connect your telephone to a duplex jack inserted into your wall jack.

Note: The PHONE jack is not interchangeable with the LINE jack; do not plug the telephone into the LINE jack or the line cable into the PHONE jack.

Surge Protectors and Lightning

Your modem has self-resetting lightning protection to protect it from electrical spikes on the telephone line. During an electrical storm, your safest course is to unplug your computer equipment from both the power outlet and the telephone line.

Front Panel

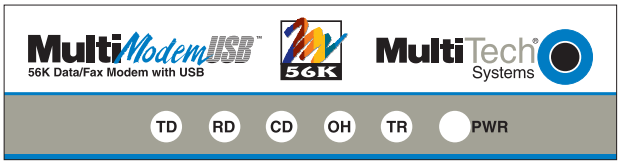

Figure 3-3. Front panel

The MT5634ZBA-USB has 6 LED indicators on the front panel that indicate status, configuration, and activity:

TD **Transmit Data.** The TD LED flashes when the modem is transmitting data to another modem.

RD **Receive Data.** The RD LED flashes when the modem is receiving data from another modem.

CD **Carrier Detect.** The CD LED lights when the modem detects a valid carrier signal from another modem. It is on when the modem is communicating with the other modem and off when the link is broken.

OH **Off-Hook.** The OH LED lights when the modem is off-hook, which occurs when the modem is dialing, online, or answering a call. The LED flashes when the modem pulse-dials.

TR **Terminal Ready.** The TR LED lights when Windows detects and initializes the modem.

Power. The PWR led lights when the system is applying power to the modem.

MultiModemISB™

56K Data/Fax Modem with USB

Chapter 4 - AT Commands, S-Registers and Result Codes

MultiTech® Systems

AT Commands

AT commands are used to control the operation of your modem. They are so called because each command must be preceded by the characters *AT* to get the *AT*tention of the modem.

AT commands can be issued only when the modem is in command mode or online command mode. The modem is in *command mode* whenever it is not connected to another modem. The modem is in *data mode* whenever it is connected to another modem and ready to exchange data. *Online command mode* is a temporary state in which you can issue commands to the modem while connected to another modem. To put the modem into online command mode from data mode, you must issue an *escape sequence* (**+++**) followed immediately by the *AT* characters and the command, e.g., **+++ATH** to hang up the modem. To return to data mode from online command mode, you must issue the command **ATO**.

To send AT commands to the modem you must use a communications program, such as the HyperTerminal applet in Windows 95 and NT 4.0, or the communications program included with your modem. You can issue commands to the modem either directly, by typing them in the terminal window of the communications program, or indirectly, by configuring the operating system or communications program to send the commands automatically. Fortunately, communications programs make daily operation of modems effortless by hiding the commands from the user. Most users, therefore, need to use AT commands only when reconfiguring the modem, e.g., to turn autoanswer on or off.

The format for entering an AT command is **AT*Xn***, where *X* is the command and *n* is the specific value for the command, sometimes called the command *parameter*. The value is always a number. If the value is zero, you can omit it from the command; thus, **AT&W** is equivalent to **AT&W0**. Most commands have a *default* value, which is the value that is set at the factory. The default values are shown in the “AT Command Summary,” which begins on the next page.

You must press ENTER to send the command to the modem. Any time the modem receives a command, it sends a response known as a *result code*. The most common result codes are *OK*, *ERROR*, and the *CONNECT* messages that the modem sends to the computer when it is connecting to another modem. For a table of valid result codes, see “Result Codes” at the end of this chapter.

You can issue several commands in one line, in what is called a command *string.* The command string begins with **AT** and ends when you press ENTER. Spaces to separate the commands are optional; they are ignored by the command interpreter. The most familiar command string is the *initialization string*, which is used to configure the modem when it is turned on or reset, or when your communications software calls another modem.

AT Command Summary

Command: **AT** **Attention Code**
Values: n/a
Description: The attention code precedes all command lines except **A/**, **A:**, and escape sequences.

Command: **ENTER Key**
Values: n/a
Description: Press the ENTER (RETURN) key to execute most commands.

Command: **A** **Answer**
Values: n/a
Description: Answer call before final ring.

Command: **A/** **Repeat Last Command**
Values: n/a
Description: Repeat the last command string. Do not precede this command with **AT**. Do not press ENTER to execute.

Command: **B*n*** **Communication Standard Setting**
Values: *n* = 0–3, 15, 16
Default: 1 and 16
Description: B0 Select ITU-T V.22 mode when modem is at 1200 bps.
B1 Select Bell 212A when modem is at 1200 bps.
B2 Deselect V.23 reverse channel (same as ***B3***).
B3 Deselect V.23 reverse channel (same as ***B2***).
B15 Select V.21 when the modem is at 300 bps.
B16 Select Bell 103J when the modem is at 300 bps.

Command: **C*n*** **Carrier Control**
Values: *n* = 1
Default: 1
Description: C0 Transmit carrier always off. (Not supported.)
C1 Normal transmit carrier switching (included for backward compatibility with some software).

Command: **D*s*** **Dial**
Values: *s* = dial string (phone number and dial modifiers)
Default: none
Description: Dial telephone number *s*, where *s* may up to 40 characters long and include the 0–9, *, #, A, B, C, and D characters, and the **L**, **P**, **T**, **V**, **W**, **S**, comma (**,**), semicolon (**;**), **!**, @, **^** and **$** dial string modifiers.

Dial string modifiers:

L Redial last number. (Must be placed immediately after **ATD**.)
P Pulse-dial following numbers in command.
T Tone-dial following numbers in command (default).
V Switch to speakerphone mode and dial the following number. Use **ATH** command to hang up.
W Wait for a new dial tone before continuing to dial. (**X2**, **X4**, **X5**, **X6**, or **X7** must be selected.)
, Pause during dialing for time set in register S8.
; Return to command mode after dialing. (Place at end of dial string.)
! Hook flash. Causes the modem to go on-hook for one-half second, then off-hook again.

@ Wait for quiet answer. Causes modem to wait for a ringback, then 5 seconds of silence, before processing next part of command. If silence is not detected, the modem returns a NO ANSWER code.

^ Disable data calling tone transmission.

$ Detect AT&T call card "bong" tone. The character should follow the phone number and precede the user's call card number: **ATDT10288061278535000$123456789**

Command: **DS=*y*** **Dial Stored Telephone Number**
Values: *n* = 0–3
Default: none
Description: Dial a number previously stored in directory number *y* by the ***&Zy=x*** command.
Example: **ATDS=3**

Command: **E*n*** **Echo Command Mode Characters**
Values: *n* = 0 or 1
Default: 1
Description: E0 Do not echo keyboard input to the terminal.
E1 Do echo keyboard input to the terminal.

Command: **F*n*** **Echo Online Data Characters**
Values: *n* = 1
Default: 1
Description: F0 Enable online data character echo. (Not supported.)
F1 Disable online data character echo (included for backward compatibility with some software).

Command: **H*n*** **Hook Control**
Values: *n* = 0 or 1
Default: 0
Description: H0 Go on-hook (hang up).
H1 Go off-hook (make the phone line busy).

Command: **I*n*** **Information Request**
Values: *n* = 0–5, 9, 11
Default: None
Description: I0 Display default speed and controller firmware version.
I1 Calculate and display ROM checksum (e.g., *12AB*).
I2 Check ROM and verify the checksum, displaying *OK* or *ERROR*.
I3 Display default speed and controller firmware version.
I4 Display firmware version for data pump (e.g., *94*).
I5 Display the board ID: software version, hardware version, and country ID
I9 Display the country code (e.g., *NA Ver. 1*).
I11 Display diagnostic information for the last modem connection, such as DSP and firmware version, link type, line speed, serial speed, type of error correction/data compression, number of past retrains, etc.

Command: **L*n*** **Monitor Speaker Volume**
Values: *n* = 0, 1, 2, or 3
Default: 2
Description: L0 Select low volume.
L1 Select low volume.
L2 Select medium volume.
L3 Select high volume.

Command: **M*n*** **Monitor Speaker Mode**
Values: *n* = 0, 1, 2, or 3
Default: 1
Description: M0 Speaker always off.
M1 Speaker on until carrier signal detected.
M2 Speaker always on when modem is off-hook.
M3 Speaker on until carrier is detected, except while dialing.

Command: **N*n*** **Modulation Handshake**
Values: *n* = 0 or 1
Default: 1
Description: N0 Modem performs handshake only at communication standard specified by ***S37*** and the ***B*** command.
N1 Modem begins handshake at communication standard specified by ***S37*** and the ***B*** command. During handshake, fallback to a lower speed can occur.

Command: **O*n*** **Return Online to Data Mode**
Values: 0, 1, 3
Default: None
Description: O0 Exit online command mode and return to data mode (see ***+++AT<CR>*** escape sequence).
O1 Issue a retrain and return to online data mode.
O3 Issue a rate renegotiation and return to data mode.

Command: **P** **Pulse Dialing**
Values: P, T
Default: T
Description: Configures the modem for pulse (non-touch-tone) dialing. Dialed digits are pulsed until a ***T*** command or dial modifier is received.

Command: **Q*n*** **Result Codes Enable/Disable**
Values: *n* = 0 or 1
Default: 0
Description: Q0 Enable result codes.
Q1 Disable result codes.
Q2 Returns an *OK* for backward compatibility with some software.

Command: **S*r*=*n*** **Set Register Value**
Values: *r* = S-register number; *n* varies
Default: None
Description: Set value of register S*r* to value of *n*, where *n* is entered in decimal format. E.g., **S0=1**.

Command: **S*r*?** **Read Register Value**
Values: *r* = S-register number
Default: None
Description: Read value of register S*r* and display it in 3-digit decimal form. E.g., **S2?** gives the response *043*.

Command: **T** **Tone Dialing**
Values: P, T
Default: T
Description: Configures the modem for DTMF (touch-tone) dialing. Dialed digits are tone dialed until a ***P*** command or dial modifier is received.

Command: **V*n*** **Result Code Format**
Values: *n* = 0 or 1
Default: 1
Description: V0 Displays result codes as digits (terse response).
V1 Displays result codes as words (verbose response).

Command: **W*n*** **Result Code Options**
Values: *n* = 0, 1, or 2
Default: 2
Description: W0 CONNECT result code reports serial port speed, disables protocol result codes.
W1 CONNECT result code reports serial port speed, enables protocol result codes.
W2 CONNECT result code reports line speed, enables protocol result codes.

Command: **X*n*** **Result Code Selection**
Values: *n* = 0–7
Default: 4
Description: X0 Basic result codes (*e.g., CONNECT*); does not look for dial tone or busy signal.
X1 Extended result codes (*e.g., CONNECT 46000 V42bis*); does not look for dial tone or busy signal.
X2 Extended result codes with *NO DIALTONE*; does not look for busy signal.
X3 Extended result codes with *BUSY*; does not look for dial tone.
X4 Extended result codes with *NO DIALTONE* and *BUSY*.
X5 Extended result codes with *NO DIALTONE* and *BUSY*.
X6 Extended result codes with *NO DIALTONE* and *BUSY*.
X7 Basic result codes with *NO DIALTONE* and *BUSY*.

Command: **Y*n*** **Long Space Disconnect**
Values: *n* = 0
Default: 0
Description: Y0 Disable sending or responding to long space break signal on disconnect.
Y1 Enable sending or responding to long space break signal on disconnect. (Not supported.)

Command: **Z*n*** **Modem Reset**
Values: *n* = 0 or 1
Default: None
Description: Z0 Reset modem to profile saved by the last ***&W*** command.
Z1 Same as ***Z0***.

Command: **&B*n*** **V.32 Auto Retrain**
Values: *n* = 1
Default: 1
Description: &B0 Disable V.32 auto retrain. (Not supported.)
&B1 Enable V.32 auto retrain.

Command: **&C*n*** **Data Carrier Detect (DCD) Control**
Values: *n* = 0 or 1
Default: 1
Description: &C0 Forces the DCD circuit to be always high.
&C1 DCD goes high when the remote modem's carrier signal is detected, and goes low when the carrier signal is not detected.

Command: **&D*n*** **Data Terminal Ready (DTR) Control**
Values: *n* = 0, 1, 2, or 3
Default: 2
Description: &D0 Modem ignores the true status of the DTR signal and responds as if it is always on.
&D1 If DTR drops while in online data mode, the modem enters command mode, issues an *OK*, and remains connected.
&D2 If DTR drops while in online data mode, the modem hangs up. If the signal is not present, the modem will not answer or dial.
&D3 If DTR drops, the modem hangs up and resets as if an **ATZ** command were issued.

Command: **&F*n*** **Load Factory Settings**
Values: *n* = 0
Default: None
Description: &F0 Load factory settings as active configuration.

Note: See also the ***Z*** command.

Command: **&G*n*** **V.22bis Guard Tone Control**
Values: *n* = 0, 1, or 2
Default: 0
Description: &G0 Disable guard tone.
&G1 Set guard tone to 550 Hz.
&G2 Set guard tone to 1800 Hz.

Note: The ***&G*** command is not used in North America.

Command: **&J*n*** **Auxiliary Relay Control**
Values: *n* = 0
Default: 0
Description: &J0 The auxiliary relay is never closed.
&J1 Not supported—responds *ERROR*.

Command: **&K*n*** **Flow Control Selection**
Values: *n* = 0, 3, or 4
Defaults: 3
Description: &K0 Disable flow control.
&K3 Enable CTS/RTS hardware flow control.
&K4 Enable XON/XOFF software flow control.

Command: **&M*n*** **Communications Mode**
Values: *n* = 0
Defaults: 0
Description: &M0 Asynchronous mode.
&M1 Not supported—responds *ERROR*.

Command: **&Q*n*** **Asynchronous Communications Mode**
Values: *n* = 0, 5, 6, 8, or 9
Default: 5
Description: &Q0 Asynchronous with data buffering. Same as **I*N0***.
&Q5 Error control with data buffering. Same as **I*N3***.
&Q6 Asynchronous with data buffering. Same as **I*N0***.
&Q8 MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in ***S36***.
&Q9 V.42 or MNP error control mode. If neither error control is established, the modem falls back according to the setting in ***S36***.

Command: **&S*n*** **Data Set Ready (DSR) Control**
Values: *n* = 0 or 1
Default: 0
Description: &S0 Force DSR always high (on).
&S1 Let DSR go high only during a connection.

Command: **&T*n*** **V.54 Test Commands**
Values: *n* = 0, 1, 3 or 6
Default: None
Description: &T0 Abort. Stop any test in progress.
&T1 Local analog loopback test.
&T3 Local digital loopback test.
&T6 Remote digital loopback test.

Note: To stop a test, you must use the escape sequence (**+++AT**) before typing **AT&T0**.

Command: **&V** **Display Current Settings**
Values: n/a
Description: Displays the active modem settings, including the callback security settings if callback security is enabled. If the setup password has been entered, it also displays the callback security passwords.

Command: **&W*n*** **Store Current Configuration**
Values: *n* = 0
Default: None
Description: &W0 Stores current modem settings in nonvolatile memory and causes them to be loaded at power-on or following the **ATZ** command instead of the factory defaults. See also the ***&F*** command.
&W1 Clears user default settings from nonvolatile memory and causes the factory defaults to be loaded at power-on or following the **ATZ** command.

Command: **&Y*n*** **Select Stored Configuration for Hard Reset**
Values: *n* = 0
Default: 0
Description: &Y0 Select stored configuration 0 on power-up. (For backward compatibility with some software.)
&Y1 Not supported—responds *ERROR*.

Command: **&Zy=*x*** **Store Dialing Command**
Values: *y* = 0–3 (callback security disabled) or 0–29 (callback security enabled)
x = Dialing command
Default: None
Description: Stores dialing command *x* in memory location *y*. Dial the stored number using the command **ATDS=y**. See also the ***#CBSn*** command. For callback security options, see Chapter 6.

Command: **\A*n*** **Select Maximum MNP Block Size**
Values: *n* = 0, 1, 2, or 3
Default: 3
Description: \A0 64-character maximum.
\A1 128-character maximum.
\A2 192-character maximum.
\A3 256-character maximum.

Command: **\B*n*** **Transmit Break**
Values: *n* = 0–9 in 100 ms units
Default: 3
Description: In non-error-correction mode only, sends a break signal of the specified length to a remote modem. Works in conjunction with the **I*K*** command.

Command: **\G*n*** **Modem Port Flow Control**
Values: *n* = 0
Default: 0
Description: \G0 Returns an *OK* for backward compatibility with some software.
\G1 Not supported—responds *ERROR*.

Command: **\J*n*** **Data Buffer Control**
Values: *n* = 0
Default: 0
Description: \J0 Enable data buffer—serial port speed is independent of connect speed.
\J1 Disable data buffer—serial port speed is forced to the line speed.

Command: **\K*n*** **Break Control**
Values: *n* = 0–5
Default: 5
Description: Controls the response of the modem to a break received from the computer, the remote modem, or the **I*B*** command. The response is different for each of three different states.

Data mode. The modem receives the break from the computer:
\K0 Enter online command mode, no break sent to the remote modem.
\K1 Clear data buffers and send break to the remote modem.
\K2 Same as **I*K0***.
\K3 Send break immediately to the remote modem .
\K4 Same as **I*K0***.
\K5 Send break to the remote modem in sequence with the transmitted data.

Data mode. The modem receives the break from the remote modem:
\K0 Clear data buffers and send break to the computer.
\K1 Same as **I*K0***.
\K2 Send break immediately to the computer.
\K3 Same as **I*K2***.
\K4 Send break to the computer in sequence with the received data.
\K5 Same as **I*K4***.

Online command mode. The modem receives a **I*Bn*** command from the computer:
\K0 Clear data buffers and send break to the remote modem.
\K1 Same as **I*K0***.
\K2 Send break immediately to the remote modem.
\K3 Same as **I*K2***.
\K4 Send break to the remote modem in sequence with the transmitted data.
\K5 Same as **I*K4***.

Command: **\N*n*** **Error Correction Mode Selection**
Values: *n* = 0–5, or 7
Default: 3
Description: \N0 Non-error correction mode with data buffering (buffer mode; same as ***&Q6***).
\N1 Direct mode.
\N2 MNP reliable mode. If the modem cannot make an MNP connection, it disconnects.
\N3 V.42/MNP auto-reliable mode. The modem attempts first to connect in V.42 error correction mode, then in MNP mode, and finally in non-error-correction (buffer) mode with continued operation.
\N4 V.42 reliable mode. If the modem cannot make a V.42 connection, it disconnects.
\N5 V.42, MNP, or non-error correction (same as ***I N3***).
\N7 V.42, MNP, or non-error correction (same as ***I N3***).

Command: **\Q*n*** **Flow Control Selection**
Values: *n* = 0, 1, or 3
Default: 3
Description: \Q0 Disable flow control (same as ***&K0***).
\Q1 XON/XOFF software flow control (same as ***&K4***).
\Q2 CTS-only flow control. Not supported.
\Q3 RTS/CTS hardware flow control (same as ***&K3***).

Command: **\T*n*** **Inactivity Timer**
Values: *n* = 0, 1–255
Default: 0
Description: \Tn Sets the time (in minutes) after the last character is sent or received that the modem waits before disconnecting. A value of zero disables the timer. Applies only in buffer mode.

Note: You can also set the inactivity timer by changing the value of ***S30***.

Command: **\V*n*** **Protocol Result Code**
Values: *n* = 0, 1, or 2
Default: 1
Description: \V0 Disable the appending of the protocol result code to the DCE speed.
\V1 Enable the appending of the protocol result code to the DCE speed.
\V2 Same as ***I V1***.

Command: **\X*n*** **XON/XOFF Pass-Through**
Values: *n* = 0 or 1
Defaults: 0
Description: \X0 Modem responds to and discards XON/XOFF characters.
\X1 Modem responds to and passes XON/XOFF characters.

Command: **-C*n*** **Data Calling Tone**
Values: *n* = 0 or 1
Defaults: 0
Description: -C0 Disable V.25 data calling tone to deny remote data/fax/voice discrimination.
-C1 Enable V.25 data calling tone to allow remote data/fax/voice discrimination.

Command: **%B** **View Numbers in Blacklist**
Values: n/a
Description: If blacklisting is in effect, **AT%B** displays the numbers for which the last call attempted in the previous two hours failed. In countries that do not require blacklisting, the *ERROR* result code appears.

Command: **%C*n*** **Data Compression Control**
Values: *n* = 0 or 1
Default: 1
Description: %C0 Disable V.42bis/MNP 5 data compression.
%C1 Enable V.42bis/MNP 5 data compression.

Command: **%DC*n*** **AT Command Control**
Values: *n* = 0 or 1
Default: 0
Description: %DC0 The modem responds to AT commands.
%DC1 The modem ignores AT commands.

Note: The modem will respond to **AT%DC** for 10 seconds after power-up.

Command: **%E*n*** **Fallback and Fall Forward Control**
Values: *n* = 0, 1, or 2
Default: 2
Description: %E0 Disable fallback and fall forward.
%E1 Enable fallback, disable fall forward.
%E2 Enable fallback and fall forward.

Command: **#S*x*** **Enter Setup Password**
Values: *x*= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Enters the remote configuration setup password.

Command: **#S=*x*** **Store Setup Password**
Values: *x*= password (1–8 characters, case sensitive)
Default: MTSMODEM
Description: Stores a new remote configuration setup password.

Command: **+++AT<CR> Escape Sequence**
Values: n/a
Description: Puts the modem in command mode (and optionally issues a command) while remaining online. Type **+++AT** and up to ten command characters, then press ENTER. Used mostly to issue the hang-up command: **+++ATH<CR>**.

Command: **%%%AT<CR> Remote Configuration Escape Sequence**
Values: n/a
Description: Initiates remote configuration mode while online with remote modem. The remote configuration escape character (%) is defined in register ***S13***.

S-Registers

Certain modem values, or parameters, are stored in memory locations called S-registers. Use the **S** command to read or to alter the contents of S-registers (see previous section).

Register	Unit	Range	Default	Description
S0	1 ring	0, 1–255	1	Sets the number of rings until the modem answers. **ATS0=0** disables autoanswer completely.
S1	1 ring	0–255	0	Counts the rings that have occurred.
S2	decimal	0–127 128–255	43 (+)	Sets ASCII code for the escape sequence character. Values greater than 127 disable escape.
S3	decimal	0–127	13 (^M)	Sets the ASCII code for the carriage return character.
S4	decimal	0–127	10 (^J)	Sets the ASCII code for the line feed character.
S5	decimal	0–32 33–127	8 (^H)	Sets the ASCII code for the backspace character. Values greater than 32 disable backspace.
S6	seconds	2–65*	2*	Sets the time the modem waits after it goes off-hook before it begins to dial the telephone number.
S7	seconds	1–255*	50*	Sets the time the modem waits for a carrier signal before aborting a call. Also sets the wait for silence time for the @ dial modifier.
S8	seconds	0–65	2	Sets the length of a pause caused by a comma character in a dialing command.
S9	decimal	0, 1–127	37 (%)	Sets ASCII code for remote configuration escape character. **S9=0** disables remote configuration.
S10	100 ms	1–254	20	Sets how long a carrier signal must be lost before the modem disconnects.
S11	1 ms	50–150*	95*	Sets spacing and duration of dialing tones.
S28	decimal	0, 1–255	1	0 disables, 1–255 enables V.34 modulation.
S30	1 minute	0, 1–255	0	Sets the length of time that the modem waits before disconnecting when no data is sent or received. A value of zero disables the timer. See also the ***IT*** command.
S35	decimal	0–1	0	0 disables, 1 enables the V.25 data calling tone, which allows remote data/fax/voice discrimination.
S36	decimal	0–7	7	Specifies the action to take in the event of a negotiation failure when error control is selected. (See ***S48***.)

Register	Unit	Range	Default	Description
S37	decimal	0–19	0	Sets the maximum V.34 “upstream” speed at which the modem attempts to connect. 0 = maximum modem speed 1 = reserved 2 = 1200/75 bps 3 = 300 bps 4 = reserved 5 = 1200 bps 6 = 2400 bps 7 = 4800 bps 8 = 7200 bps 9 = 9600 bps 10 = 12000 bps 11 = 14400 bps 12 = 16800 bps 13 = 19200 bps 14 = 21600 bps 15 = 24000 bps 16 = 26400 bps 17 = 28800 bps 18 = 31200 bps 19 = 33600 bps
S38	decimal	0–14	1	Sets the maximum 56K “downstream” speed at which the modem attempts to connect. The default maximum speed is 56K bps. 0 = 56K disabled 1 = 56K enabled* 2 = 32000 bps 3 = 34000 bps 4 = 36000 bps 5 = 38000 bps 6 = 40000 bps 7 = 42000 bps 8 = 44000 bps 9 = 46000 bps 10 = 48000 bps 11 = 50000 bps 12 = 52000 bps 13 = 54000 bps 14 = 56000 bps * with automatic speed selection at maximum modem speed
S42	decimal	0–1	1	Enables/disables the 56K auto rate. When 56K auto is disabled, fallback to V.34 is also disabled. 0 = disable; 1 = enable.
S43	decimal	0–1	1	*For testing and debugging only.* Enables/disables V.32bis start-up auto mode operation. 0 = disable; 1 = enable.

Register	Unit	Range	Default	Description
S48	decimal	7 or 128	7	Enables (7) or disables (128) LAPM negotiation. The following table lists the ***S36*** and ***S48*** configuration settings for certain types of connections.
S89	seconds	0, 5–255	10	Sets the length of time in the off-line command mode before the modem goes into standby mode. A value of zero prevents standby mode; a value of 1–4 sets the value to 5.

	S48=7	S48=128
S36=0, 2	LAPM or hangup	Do not use
S36=1, 3	LAPM or async	Async
S36=4, 6	LAPM, MNP, or hangup	MNP or hangup
S36=5, 7	LAPM, MNP, or aysnc	MNP or async

Result Codes

In command mode your modem can send responses called *result codes* to your computer. Result codes are used by communications programs and can also appear on your monitor.

Terse	Verbose	Description
0	*OK*	Command executed
1	*CONNECT*	Modem connected to line
2	*RING*	Ring signal detected
3	*NO CARRIER*	Carrier signal lost or not detected
4	*ERROR*	Invalid command
*5 **	*CONNECT 1200*	Connected at 1200 bps
6	*NO DIALTONE*	No dial tone detected
7	*BUSY*	Busy signal detected
8	*NO ANSWER*	No answer at remote end
*10**	*CONNECT 2400*	Connected at 2400 bps
*11**	*CONNECT 4800*	Connected at 4800 bps
*12**	*CONNECT 9600*	Connected at 9600 bps
*13**	*CONNECT 14400*	Connected at 14400 bps
*14**	*CONNECT 19200*	Connected at 19200 bps
*24**	*CONNECT 7200*	Connected at 7200 bps
*25**	*CONNECT 12000*	Connected at 12000 bps
*26**	*CONNECT 16800*	Connected at 16800 bps
*40**	*CONNECT 300*	Connected at 300 bps
*55**	*CONNECT 21600*	Connected at 21600 bps
*56**	*CONNECT 24000*	Connected at 24000 bps
*57**	*CONNECT 26400*	Connected at 26400 bps
*58**	*CONNECT 28800*	Connected at 28800 bps
*59**	*CONNECT 31200*	Connected at 31200 bps
*60**	*CONNECT 33600*	Connected at 33600 bps
*70**	*CONNECT 32000*	Connected at 32000 bps, 56K rate
*71**	*CONNECT 34000*	Connected at 34000 bps, 56K rate
*72**	*CONNECT 36000*	Connected at 36000 bps, 56K rate
*73**	*CONNECT 38000*	Connected at 38000 bps, 56K rate
*74**	*CONNECT 40000*	Connected at 40000 bps, 56K rate
*75**	*CONNECT 42000*	Connected at 42000 bps, 56K rate
*76**	*CONNECT 44000*	Connected at 44000 bps, 56K rate
*77**	*CONNECT 46000*	Connected at 46000 bps, 56K rate
*78**	*CONNECT 48000*	Connected at 48000 bps, 56K rate
*79**	*CONNECT 50000*	Connected at 50000 bps, 56K rate
*80**	*CONNECT 52000*	Connected at 52000 bps, 56K rate
*81**	*CONNECT 54000*	Connected at 54000 bps, 56K rate
*82**	*CONNECT 56000*	Connected at 56000 bps, 56K rate
88	*DELAYED*	Delay is in effect for the dialed number
89	*BLACKLISTED*	Dialed number is blacklisted
90	*BLACKLIST FULL*	Blacklist is full

* *EC* is added to these result codes when the extended result codes configuration option is enabled. *EC* is replaced by one of the following codes, depending on the type of error control connection:

V42bis —V.42 error control (LAP-M) and V.42bis data compression
V42 —V.42 error control (LAP-M) only
MNP5 —MNP 4 error control and MNP 5 data compression
MNP4 —MNP 4 error control only
NoEC —No error control protocol).

MultiModemISB™

56K Data/Fax Modem with USB

Chapter 5 - Remote Configuration

MultiTech® Systems

Introduction

Remote configuration is a network management tool that allows you to configure modems anywhere in your network from one location. With password-protected remote configuration, you can issue AT commands to a remote MT5634ZBA-USB modem for maintenance or troubleshooting as if you were on-site.

Basic Procedure

The following steps are valid regardless of whether the connection is established by the local or the remote Multi-Tech modem.

1. Establish a data connection with a remote MT5634ZBA-USB modem.
2. Send three remote configuration escape characters followed by **AT** and the setup password, and press ENTER. Example: **%%%ATMTSMODEM<CR>**. You have four tries to enter the correct password before being disconnected. If the password is correct, the remote modem responds with

   OK
3. You can now send AT commands to configure the remote modem.
4. When you have finished configuring the remote modem, save the new configuration by typing **AT&W0<CR>**, then type **ATO<CR>** to exit remote configuration. You can then break the connection in the normal way.

   CAUTION: If you hang up while you are in remote configuration mode, it may lock up the remote modem.

Setup

Multi-Tech modems are shipped with a default setup password (MTSMODEM). Because anyone who has an owner's manual knows the default setup password, for security you should change the password and possibly also the remote configuration escape character.

Changing the Setup Password

1. Open a data communications program such as HyperTerminal.
2. In the terminal window, type **AT#SMTSMODEM** (or **AT#Syyyyyy** if you have replaced the MTSMODEM password with yyyyyy) and press ENTER. The modem responds with **OK** if the setup password is correct, and **ERROR** if it is wrong.
3. To change the password, type **AT#S=yyyyyy**, where yyyyyy stands for the password, and press ENTER. The password can include any keyboard character, and must be one to eight characters long. The modem responds with **OK**.
4. The new password is saved automatically. You can now either enter more AT commands or exit the data communications program. The next time you remotely configure the modem you must use the new setup password.

   Note: You can only change the setup password locally; you cannot do it remotely. Also, passwords are case sensitive. The next time you enter the password, it must be in the same case as you set it up.

Changing the Remote Escape Character

To increase security, you can change a remote modem's remote configuration escape character. The remote configuration escape character is stored in register ***S9***. The factory default is 37, which is the ASCII code for the percent character (%). Setting ***S9*** to 0 (zero) disables remote configuration entirely—but if you do this remotely, you won't be able to change it back remotely!

1. Establish a remote configuration link with the remote modem as described in "Basic Procedure."
2. Type **ATS9=*n***, where *n* is the ASCII code for the new remote configuration escape character, then press ENTER.
3. Save the new value by typing **AT&W** and pressing ENTER.
4. Type **ATO<CR>** to exit remote configuration.

MultiModemISB™

56K Data/Fax Modem with USB

Chapter 6 - Troubleshooting

MultiTech® Systems

Introduction

Your modem was thoroughly tested at the factory before it was shipped. If you are unable to make a successful connection, or if you experience data loss or garbled characters during your connection, it is possible that the modem is defective. However, it is more likely that the source of your problem lies elsewhere. The following symptoms are typical of problems you might encounter:

- None of the LEDs light when the modem is on.
- The modem does not respond to commands.
- The modem dials but is unable to make a connection.
- The modem disconnects while online.
- The modem cannot connect when answering.
- The modem doesn't work with Caller ID.
- Fax and data software can't run at the same time.

If you experience problems, please check the following possibilities before calling Technical Support (see Appendix D).

None of the Indicators Light

When you plug in the modem, the Power LED should come on. After the operating system detects and configures the modem, the TR LED should come on.

- If the Power LED does not come on, double check the cable connections.
- If the TR LED does not come on, check to see that the software from the installation disk has been installed (see Chapter 2, Step 3).

The Modem Does Not Respond to Commands

- Make sure you are issuing the modem commands from the data communications software, either manually in terminal mode or automatically by configuring the software. (You cannot send commands to the modem from the DOS prompt.)
- Make sure you are in terminal mode in your data communications program, then type **AT** and press ENTER. If you get an *OK* response, your connections are good and the problem likely is in the connection setup in your communications software.
- Try resetting your modem by unplugging the USB cable from the modem, and then plugging it back in.
- Try rebooting the computer.
- The modem might be defective. If you have another Multi-Tech modem, try swapping modems. If the problem goes away, the first modem is possibly defective. Call Tech Support for assistance (see Appendix D).

The Modem Dials But Cannot Connect

There can be several reasons the ZBA fails to make a connection. Possibilities include

- lack of a physical connection to the telephone line.
- a wrong dial tone.
- a busy signal.
- a wrong number.
- no modem at the other end.
- a faulty modem, computer, or software at the other end.
- incompatibility between modems.

You can narrow the list of possibilities by using extended result codes. Extended result codes are enabled by default. If they have been disabled, enter **ATV1X4** and press ENTER while in terminal mode, or include **V1X4** in the modem's initialization string. When you dial again, the modem will report the call's progress.

- If the modem reports *NO DIALTONE*, check that the modem's telephone line cable is connected to both the modem's LINE jack (not the PHONE jack) and the telephone wall jack. If the cable looks secure, try replacing it. If that doesn't work, the problem might be in your building's telephone installation. To test the building installation, plug a telephone into your modem's telephone wall jack and listen for a dial tone. If you hear a dial tone, your modem might be installed behind a company phone system (PBX) with an internal dial tone that sounds different from the normal dial tone. In that case, the modem might not recognize the dial tone and might treat it as an error. Check your PBX manual to see if you can change the internal dial tone; if you can't, change your modem's initialization string to replace **X4** with **X3**, which will cause the modem to ignore dial tones (note, however, that **X3** is not allowed in some countries, such as France and Spain).
- If the modem reports BUSY, the other number might be busy, in which case you should try again later, or it might indicate that you have failed to add a **9,** prefix to the phone number if you must dial *9* for an outside line.

  If you must dial *9* to get an outside line, the easiest way to dial it automatically is to include it in the modem's dial prefix, e.g., **ATDT9,**. Note the comma, which inserts a pause before the number is dialed. By inserting **9,** into the dial prefix, you do not have to include it in each directory entry.

  To change the dial prefix in Windows 98 HyperTerminal, select **Call** from the **Call** menu, click **Dialing Properties**, and type **9** in the local and long distance boxes in **How I dial from this location**.
- If the modem reports *NO ANSWER*, the other system has failed to go off-hook, or you might have dialed a wrong number. Check the number.
- If the modem reports *NO CARRIER*, the phone was answered at the other end, but no connection was made. You might have dialed a wrong number, and a person answered instead of a computer, or you might have dialed the correct number but the other computer or software was turned off or faulty. Check the number and try again, or try calling another system to make sure your modem is working. Also, try calling the number on your telephone. If you hear harsh sounds, then another modem is answering the call, and the modems might be having problems negotiating because of modem incompatibilities or line noise. Try connecting at a lower speed.

The Modem Disconnects While Online

- If you have Call Waiting on the same phone line as your modem, it can interrupt your connection when someone tries to call you. If you have Call Waiting, disable it before each call. In most telephone areas in North America, you can disable Call Waiting by preceding the telephone number with ***70** (check with your local telephone company).

  You can automatically disable Call Waiting by including the disabling code in the modem's dial prefix (e.g., **ATDT*70,**—note the comma, which inserts a pause before the number is dialed). To change the dial prefix in Windows 98 HyperTerminal, select **Call** from the **Call** menu, click **Dialing Properties**, check **This location has Call Waiting**, and select the correct code for your phone service.

- If you have extension phones on the same line as your modem, you or someone else can interrupt the connection by picking up another phone. If this is a frequent problem, disconnect the extension phones before using the modem, or install another phone line especially for the modem.
- Check for loose connections between the modem and the computer and the telephone jack.
- You might have had a poor connection because of line conditions or the problem might have originated on the other end of the line. Try again.
- If you were online with a BBS or an online service like CompuServe, it might have hung up on you because of lack of activity on your part or because you exceeded your time limit for the day. Try again.

The Modem Cannot Connect When Answering

- Autoanswer might be disabled. Turn on autoanswer in your data communications program or send the command **ATS0=1** (**ATS0=2** if you have Caller ID service) to your modem in terminal mode.

The Modem Doesn't Work with Caller ID

- Caller ID information is transmitted between the first and second rings, so if autoanswer is turned off (**S0=0**) or if the modem is set to answer after only one ring (**S0=1**), the modem will not receive Caller ID information. Check your initialization string, and if necessary change it to set the modem to answer after the second ring (**S0=2**).
- Make sure that you have Caller ID service from your telephone company.

Fax and Data Software Can't Run at the Same Time

Communications devices can be accessed by only one application at a time. In Windows 98, you can have data and fax communication applications open at the same time, but they cannot use the same modem at the same time.

MultiModemISB™

56K Data/Fax Modem with USB

Appendixes

MultiTech® Systems

Appendix A: Regulatory Compliance

FCC Regulations for Telephone Line Interconnection

1. This equipment complies with Part 68 of the Federal Communications Commission (FCC) rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

2. The suitable USOC jack (Universal Service Order Code connecting arrangement) for this equipment is shown below. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.

   An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant. See installation instructions for details.

3. The ringer equivalence number (REN) is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To learn the number of devices that may be connected to the line, contact the telephone company to determine the maximum REN for the calling area.

4. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.

6. If trouble is experienced with this equipment (the model of which is indicated below) please contact Multi-Tech Systems, Inc. at the address shown below for details of how to have repairs made. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

7. No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.

8. This equipment cannot be used on the public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

9. If so required, this equipment is hearing-aid compatible.

Manufacturer:	Multi-Tech Systems, Inc.
Model Number:	MT5634ZBA-USB
FCC Registration No:	AU7USA-24713-M5-E
Ringer Equivalence:	0.3B
Modular Jack (USOC):	RJ11C or RJ11W (single line)
Service Center in USA:	Multi-Tech Systems, Inc. 2205 Woodale Drive Mounds View, MN 55112 (800) 328-9717 (612) 785-3500 (612) 785-9874 FAX

Canadian Limitations Notice

Notice: The Industry Canada label identifies certificated equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada label does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should insure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the **supplier**. Any repairs or alterations made by the user to this equipment; or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should insure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in ICES-003 of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

FCC Fax Update

The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly contains in a margin at the top or bottom of each page or the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine or such business, other entity, or individual.

See your fax software manual for setup details.

Compliance with BABT Requirements

Approved for connection to telecommunications system specified in the instructions for use subject to the conditions set out in them.

Warning: Interconnection directly, or by way of other apparatus, of ports marked "SAFETY WARNING see instructions for use" with ports marked or not so marked may produce hazardous conditions on the network. Advice should be obtained from a competent engineer before such a connection is made.

Telephones that connect to the external socket must be approved for direct connection to the Public Switched Telephone Network (PSTN).

This apparatus has been approved for the use of the following facilities:

- Auto-calling
- Loop disconnect and MF dialing
- Phone number storage and retrieval by a predetermined code
- Operation in the absence of proceed indication
- Automatic storage of last number dialed
- Tone detection-busy
- Auto clear from the originating end
- Modem
- PBX timed break register recall

Any other usage will invalidate the approval of the apparatus if, as a result, it then ceases to comply with the standards against which approval was granted.

European Low Voltage Directive

When correctly installed, the modem will present no hazard to the user. When correctly installed, the modem will be connected to the PSTN or a PW and to a Data Terminal Equipment (DTE), whose modem connections comply with the USB standard. The DTE connections are therefore taken to be safe voltages (less than ±30 volts).

Ports that are capable of connecting to other apparatus are defined as SELV. To ensure conformity with EN60950, ensure that these ports are only connected to ports of the same type on other apparatus.

EMC, Safety, and Terminal Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

and

Council Directive 98/13/EC of 12 March 1998 on the approximation of the laws of the Member States concerning telecommunications terminal and satellite earth station equipment.

Australian Modem Warning Notice

Modems connected to the Australian telecommunications network must have a valid AUSTEL permit. This modem has been specifically configured to ensure compliance with AUSTEL Standards. The following commands can affect compliance and must not be set outside the permissible range.

Modem Commands

Command	Default	Permissible Range
A:	Do not use	—
ATB	B0	Do not change
AT&G	&G2	Do not change
AT&P	&P1	Do not change
ATSn	*see table below*	—

S-Register	Default	Permissible Range
S6	4	2–5

Call Attempts/Retries

Applications software shall be configured so that no more than 3 attempts are made to establish a connection to a given number. (Note: if the modem can detect service tones, up to 10 attempts can be made). There must be at least 2 seconds between call attempts. If the call sequence is unsuccessful, there shall be a delay of at least 30 minutes before attempting to call the number again.

Warning: Failure to set the modem, and any communications software used with the modem, to the values shown above will result in the modem being operated in a non-compliant manner. Consequently, there would be no permit in force for this equipment, and the Telecommunications Act 1991 prescribes a penalty of $12,000 for the connection of non-permitted equipment.

Warning: For safety reasons, only connect AUSTEL permitted or AUSTEL certified equipment.

New Zealand Telecom Warning Notice

Use of pulse dialing, when this equipment is connected to the same line as other equipment, may give rise to ‘bell tinkle’ or noise and may also cause a false answer condition. Should such problems occur, the user should NOT contact the Telecom Faults Service.

The preferred method of dialing is to use DTMF tones, as this is faster than pulse (decadic) dialing and is readily available on almost all New Zealand telephone exchanges.

Warning Notice: No '111' or other calls can be made from this device during a mains power failure.

Appendix B: Technical Specifications

Your MultiModemZBA-USB fax modem meets the following specifications:

Trade Name	MultiModemUSB™
Model Number	MT5634ZBA-USB
Client-to-Server Data Rates	K56flex speeds when accessing an ISP type K56flex server (actual speed depends on server capabilities and line conditions) ***
Client-to-Client Data Rates	33,600, 31,200, 28,800, 26,400, 24,000, 21,600, 19,200, 16,800, 14,400, 12,000, 9600, 7200, 4800, 2400, 1200, 0-300 bps
Fax Data Rates	14,400, 9600, 7200, 4800, 2400, 300 bps
Data Format	Serial, binary, asynchronous
Modem Compatibility	K56flex; ITU-T V.34 enhanced, V.34, V.32terbo, V.32bis, V.32, V.22bis, V.22; Bell 212A and 103/113; ITU-T V.29, V.42, V.42bis; ITU-T V.21 & V.23 in international versions
Fax Compatibility	ITU-T Group 3, Class 1 and 2, T.4, T.30, V.21, V.27ter, V.29, V.17, and TIA/EIA TR29.2
Error Correction	ITU-T V.42 (LAP-M or MNP 3–4)
Data Compression	ITU-T V.42bis (4:1 throughput), MNP 5 (2:1 throughput)
Flow Control	XON/XOFF (software), RTS/CTS (hardware)
Intelligent Features	Plug and play; fully AT command compatible; autodial, redial, repeat dial; pulse or tone dial; dial pauses; auto answer; caller ID; EIA extended automode; adaptive line probing; automatic symbol and carrier frequency during start-up, retrain, and rate renegotiation; DTMF detection; call status display, auto-parity and data rate selections; keyboard-controlled modem options; non-volatile memory; on-screen displays for modem option parameters; command lines of up to 40 characters each; help menus; remote configuration;
Command Buffer	40 characters
Data Modulation	FSK at 300 bps, PSK at 1200 bps, QAM at 2400, 4800, and 9600 bps (non-trellis), QAM with trellis-coded modulation (TCM) at 9600, 12,000, 14,400, 16,800, 19,200, 21,600, 24,000, 26,400, 28,800, 31,200, 33,600, and 56,000 bps
Fax Modulation	V.21 CH2 FSK at 300 bps (half duplex) V.27ter DPSK at 4800 and 2400 bps V.29 QAM at 9600 and 7200 bps V.17TCM at 14400, 12000, 9600, and 7200 bps
Carrier Frequencies ITU-T V.34	1600, 1646, 1680, 1800, 1829, 1867, 1920, 1959, 2000 Hz
Carrier Frequencies AT&T V.32 terbo/ ITU-T V.32bis/V.32	1800 Hz

Carrier Frequencies V.22bis/V.22 or Bell 212A Standard (2400 & 1200 bps)	Transmit originate: Transmit answer: Receive originate: Receive answer:	1200 Hz 2400 Hz 2400 Hz 1200 Hz
Carrier Frequencies ITU-T V.23 (1200 bps)	Transmit originate: Receive originate: Transmit answer: Receive answer:	390 Hz mark 450 Hz space 1300 Hz mark 2100 Hz space 1300 Hz mark 2100 Hz space 390 Hz mark 450 Hz space
Carrier Frequencies ITU-T V.21 (0–300 bps)	Transmit originate: Receive originate: Transmit answer: Receive answer:	980 Hz mark 1180 Hz space 1650 Hz mark 1850 Hz space 1650 Hz mark 1850 Hz space 980 Hz mark 1180 Hz space
Carrier Frequencies Bell 103/113 (0–300 bps)	Transmit originate: Receive originate: Transmit answer: Receive answer:	1270 Hz mark 1070 Hz space 2225 Hz mark 2025 Hz space 2225 Hz mark 2025 Hz space 1270 Hz mark 1070 Hz space
Fax Carrier Frequencies	V.21 Ch2 (half duplex): 1650 Hz mark, 1850 HZ space for transmit originate 1650 HZ mark, 1850 Hz space for transmit answer V.27ter: 1800 Hz originate/answer V.29 QAM: 1800 Hz originate/answer V.17 TCM: 1800 Hz originate/answer	
Transmit Level	-11 dBm (dial-up)	
Frequency Stability	±0.01%	
Receiver Sensitivity	-43 dBm under worst-case conditions	
AGC Dynamic Range	43 dB	
Connectors	USB connector; two RJ-11 phone jacks	
Cables	One 7-foot RJ-11 phone cable One 4-foot USB cable **Note:** Any cables connected to the computer should be shielded to reduce interference.	
Diagnostics	Power-on self test, local analog loop, local digital loop, remote digital loop.	
Indicators	LEDs for Transmit Data, Receive Data, Carrier Detect, Off Hook, Terminal Ready, Power	

Environmental	Temperature range 0°–50°C (32°–120°F); humidity range 20–90% (non-condensing)
Dimensions	10.8 cm wide x 14.8 cm long x 2.9 cm high (4.25″ x 5.8″ x 1.15″)
Weight	224 g (8 oz)
Limited Warranty	10 years

Appendix C: Loopback Tests

Introduction

Each time you turn on your modem, it performs an automatic self-test to ensure proper operation. Your modem also has three diagnostic tests: local analog loopback, remote digital loopback, and local digital loopback. These ITU-T V.54 loopback tests isolate telephone circuit and transmission problems.

In a loopback test, data from your computer loops through the circuits of your modem and/or a remote modem before it appears on your monitor. When the loop has been completed, the data on your PC's monitor should match the original data.

The local analog loopback test allows you to verify that the modem's transmitter and receiver circuits are functioning properly.

The local digital loopback allows you to verify that the local computer or terminal, the two modems, and the transmission line between them are functioning properly.

The remote digital loopback test allows you to verify that the remote computer or terminal, the remote modem, the serial ports, the telephone line, and the local modem are functioning properly.

Note: All loopback tests operate at all speeds except 300 bps.

Local Analog Loopback Test (V.54 Loop 3)

In this test, data from your computer or terminal is sent to your modem's transmitter, converted into analog form, looped back to the modem's receiver, converted into digital form, and then sent to your monitor for verification. No connection to the phone line is required.

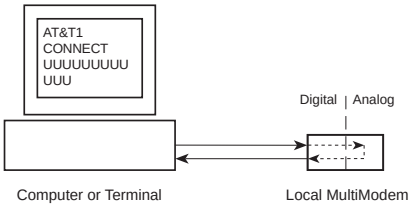

Figure C-1. Local analog loopback test.

Test Procedure

1. Connect the modem to your computer. Using your communication program, set the desired baud rate and go into terminal mode.
2. Type **AT&T1** and press ENTER. This places your modem in analog loopback mode in the originate mode. A *CONNECT* message should appear on your display. The modem is now out of command mode and in a pseudo-online mode.
3. Note that the CD LED is on. If you are set for 14,400 bps or higher, a speed LED should be on. If the CD LED is not on, there is a defect in your modem.
4. Enter characters from your keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeros. The characters entered should be displayed on your monitor. The TD and RD LEDs should flash when a character is entered.
5. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. Then type either **AT&T** or **ATH** to return to command mode.

6. Your modem passes this test if the data received on your monitor are the same as the data entered from your keyboard. If different data appear on your monitor, your modem is probably causing the problem, though it could also be your computer. If your modem passes this test, but you are receiving errors while on line, the remote modem or the phone line could be at fault.

Remote Digital Loopback Test (V.54 Loop 2)

The remote digital loopback test tests the phone lines and the circuits of both your modem and a remote modem. In this test, your modem must be on line with another modem that is set up to respond to a request for remote digital loopback. (Note that some modems might not support remote digital loopback or might have it disabled.) Data from your computer or terminal is transmitted through your modem and over the phone line to the remote modem, where it is then looped back to your modem.

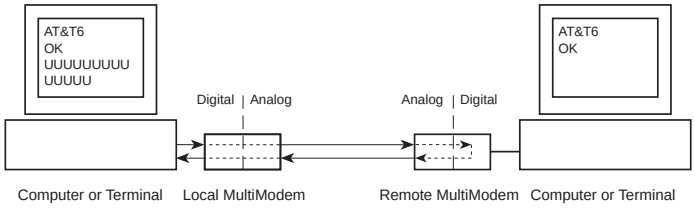

Figure C-2. Remote digital loopback test.

Test Procedure

1. Arrange to have **&T6** set on the remote test modem.
2. Open your communications software and go into terminal mode. Type **AT** and press ENTER; you should get an *OK* message. Type **AT\N** and press ENTER to disable error correction.
3. Dial the remote modem and establish your online connection.
4. Type the escape sequence **+++AT** and press ENTER to bring your modem into online command mode.
5. Type **AT&T6** and press ENTER. The local modem responds to this command by transmitting an unscrambled marking signal, which causes the remote modem to place itself in digital loopback mode. Then the local modem exits online command mode and enters data mode.
6. Enter data from your keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeroes. Data received by the remote modem enters its analog receiver, is converted to digital data, is reconverted into analog, and then is transmitted back to your modem. Your modem passes this test if the data received on your monitor is the same as the data entered from your keyboard.
7. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. The modem should respond with an *OK* message. If you wish to stay on line with the remote modem for normal data transmission, type **AT&T** and press ENTER to exit the test, then type **ATO** and press ENTER to return on line. If you wish to terminate the call, type **ATH** and press ENTER to hang up.

Local Digital Loopback Test (V.54 Loop 2)

The local digital loopback test is identical to the remote digital loopback test with one exception. Instead of using your modem to signal a remote modem to place itself in digital loopback mode, your modem is placed in digital loopback mode while the remote modem is not. Data is entered and transmitted from the remote modem, sent across the phone line to your modem, and looped back to the remote modem.

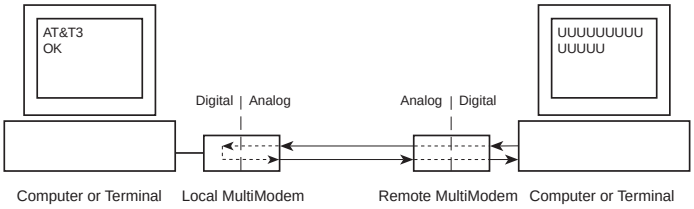

Figure C-3. Local digital loopback test

Test Procedure

1. Open your communications software and go into terminal mode. Type **AT** and press ENTER; you should get an *OK* message. Type **AT\N** and press ENTER to disable error correction.
2. Dial the remote modem and establish your online connection.
3. Type the escape sequence **+++AT** and press ENTER to bring your modem into online command mode.
4. Type **AT&T3** and press ENTER. Once you receive an *OK* message from your modem (if responses are enabled), your modem is placed in digital loopback mode.
5. Have someone enter data from the remote keyboard. For this test, typing multiple uppercase *U* characters is a good way to send an alternating test pattern of binary ones and zeros. The data received by your modem enters its analog receiver, is converted to digital data, is reconverted into analog, and then is transmitted back to the remote modem. Your modem passes this test if the data received on the remote monitor is the same as the data entered from the remote keyboard.
6. To exit the test, type the escape sequence **+++AT** and press ENTER. This puts the modem in online command mode. The modem should respond with an *OK* message. If you wish to stay on line with the remote modem for normal data transmission, type **AT&T** and press ENTER to exit the test, then type **ATO** and press ENTER to return on line. If you wish to terminate the call, type **ATH** and press ENTER to hang up.

Appendix D: Warranty, Service, and Technical Support

Limited Warranty

Multi-Tech Systems, Inc. (MTS) warrants that this product will be free from defects in material or workmanship for a period of ten years from the date of purchase or, if date of purchase is not provided, ten years from the date of shipment (limited to customers in the U.S., Canada, Mexico, and United Kingdom). For customers in all other countries, due to certain legal restrictions, MTS warrants that this product will be free from defects in material or workmanship for a period of five years from the date of purchase or, if date of purchase is not provided, five years from the date of shipment, unless otherwise limited or prohibited by law.

MTS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products that have been damaged by lightning storms, water, or power surges, or that have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products that prove to be defective within the warranty period, or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory with transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS.

Online Warranty Registration

If you have access to the World Wide Web, you can register your Multi-Tech product online at the following URL:

http://www.multitech.com/register

Service

If you are outside the USA, your local distributor of Multi-Tech products usually offers the quickest and most economical repair option. If necessary, you may send your modem to our Mounds View factory in the USA. A modem that is shipped to us from outside the USA must have a Returned Materials Authorization (RMA) and shipping instructions. To return a modem for repair from inside the USA, no RMA is required; simply send it to us freight prepaid. Include a description of the problem, a return shipping address, and a check or purchase order for out-of-warranty repairs.

Please send modems that require repairs to the following address:

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
Attn: Repair

If you are shipping from outside the USA, please contact our Repair Department for an RMA prior to your shipment. You can contact us by telephone at +(612) 785-3500 or by fax at +(612) 785-9874.

Technical Support

Multi-Tech Systems has an excellent staff of technical support personnel available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this unit, please call (800) 972-2439 (USA and Canada) or (612) 785-3500 (international and local). Please have modem information available. You can also contact Technical Support via the following URL:

http://www.multitech.com/_forms/email_tech_support.htm.

The Multi-Tech BBS

For customers who do not have Internet access, Multi-Tech maintains a bulletin board system (BBS) that mirrors its FTP site. Information available from the BBS includes new product information, product upgrade files, and problem-solving tips. The phone number for the Multi-Tech BBS is (800) 392-2432 (USA and Canada) or (612) 785-3702 (international and local).

The BBS can be accessed by any asynchronous modem operating at 1200 bps to 33,600 bps at a setting of 8 bits, no parity, and 1 stop bit (8-N-1).

To Log on to the Multi-Tech BBS

1. Set your communications program to **8-N-1**.
2. Dial our BBS at (800) 392-2432 (USA and Canada) or (612) 785-3702 (international and local).
3. At the prompts, type your first name, last name, and password; then press ENTER. If you are a first time caller, the BBS asks if your name is spelled correctly. If you answer yes, a questionnaire appears. You must complete the questionnaire to use the BBS on your first call.
4. Press ENTER until the Main Menu appears. From the Main Menu you have access to two areas: the Files Menu and News. For help on menu commands, type **?**.

To Download a File

If you know the file name

1. From the Main Menu, type **F** to access the Files Menu, then type **D**.
2. Enter the name of the file you wish to download from the BBS.
3. If a password is required, enter the password.
4. Answer **Y** or **N** to the automatic logoff question.
5. Select a file transfer protocol by typing the indicated letter, such as **Z** for Zmodem (the recommended protocol).
6. If you select Zmodem, the transfer will begin automatically. If you select another protocol, you may have to initiate the transfer yourself. (In most data communications programs, the PAGE DOWN key initiates the download.)
7. When the download is complete, press ENTER to return to the File Menu.
8. To exit the BBS, type **G** and press ENTER.

If you don't know the file name

1. From the Main Menu, type **F** to access the Files Menu. For a list of file areas, type **L**, press ENTER, then type **L** and press ENTER again. (If you do not type the second *L*, you will list all of the files on the BBS.)
2. Mark each file area you would like to examine by typing its list number and pressing ENTER.
3. Enter **L** to list all the files in the selected file areas. Enter **C** to go forward in the file list and **P** to go back.
4. To mark one or more files for download, type **M**, press ENTER, type the list numbers of the files, and press ENTER again.
5. Enter **D**. You will see a list of the files you have marked. Enter **E** if you would like to edit the list; otherwise enter **D** again to start the download process.
6. Select a file transfer protocol by typing the indicated letter, such as **Z** for Zmodem (the recommended protocol).
7. If you select Zmodem, the file will transfer automatically. If you select another protocol, you may have to initiate the transfer yourself. (In most data communications programs, the PAGE DOWN key initiates the download.)
8. When the download is complete, press ENTER to return to the File Menu.
9. To exit the BBS, type **G** and press ENTER.

About the Internet

Multi-Tech is a commercial provider on the Internet, and we retrieve e-mail messages from the following mailboxes on a periodic basis:

Multi-Tech's presence includes a Web site at:

http://www.multitech.com

and an ftp site at:

ftp://ftp.multitech.com

About CompuServe

In addition to the BBS, Multi-Tech provides support through CompuServe's Modem Vendor Forum (GO MODEMVEN) under GO MULTITECH. Refer to your CompuServe documentation for special operating procedures.

About the Multi-Tech Fax-Back Service

Multi-Tech's fax-back system provides 24-hour access to sales, marketing, and technical literature for customers in the U.S.A. Dial (612) 717-5888, follow the voice prompts, and enter the document number for either the Sales and Marketing catalog or the Technical Support catalog of documents. For convenience, write your fax number in the following space: _____.

From the Sales and Marketing catalog, you can request to have newsletters, white papers, press releases, brochures, and other marketing literature faxed to you. From the Technical Support catalog, you can request basic modem operation information and troubleshooting guides. With either catalog, simply enter the FB Doc. number of the literature you wish to receive.

Index

Symbols

56K operation
  disabling the auto rate 37
  maximum connect speed 37

A

abort timer 36
analog loopback test 58
Answer command 27
assembling the modem 11
Asynchronous Communications Mode command 31
AT Command Control command 35
AT commands 20, 26–63
  definition 26
  descriptions 27–63
  disabling response to 35
  format 26
attention code 27
Australian regulations 53–63
autoanswer 26, 36, 48
Auxiliary Relay Control command 31

B

BABT compliance 52–63
backspace character, setting 36
BBS, Multi-Tech 15, 62
Bell 212A mode 27
blacklisting 34
Break Control command 33
break signal 33

C

Call Waiting 48
callback security
  displaying settings 32
  setup password 35
Caller ID 48
Canadian regulations 51–63
carriage return character 36
Carrier Control command 27
carrier loss disconnect time, setting 36
CD indicator 58
comma, setting pause time 36
command mode 26
command string 26
Communication Standard command 27
Communications Mode command 31
communications programs 21, 26, 46
compression, data 20
CompuServe 63
computer, connecting to 22
configuration
  selecting reset configuration 32
  storing 32
connect messages 39
connecting the modem 12, 22–63
country code, displaying 28

D

Data Buffer Control command 33
data buffering 31
data calling tone 36
Data Calling Tone command 34
Data Carrier Detect command 30
data communications, testing 15
data compression 20
Data Compression Control command 35
data mode 26, 29, 59
data rates 20
Data Set Ready Control command 32
Data Terminal Ready command 31
DCD Control command 30
default settings 31
diagnostic information, displaying 28
Dial command 27
Dial Stored Telephone Number command 28
dial string modifiers 27
dialing tones 36
digital loopback tests 59–63
disconnect delay 36
Display Current Settings command 32
DOC regulations 51–63
downloading 15
DSR Control command 32
DTR Control command 31

E

Echo Command Mode Characters command 28
Echo Online Data Characters command 28
ENTER key 27
Enter Setup Password command 35
equipment, required 21
error control, setting 36, 38
error correction 20
  disabling 59, 60
Error Correction Mode Selection command 34
escape character 36
escape sequence 26, 35

F

fall-forward 20
fallback 20, 29
Fallback and Fall Forward command 35
fax communications 16, 21
fax-back service 63
FCC regulations 50–63, 52
features 20
firmware version, displaying 28
flow control 31, 33, 34
Flow Control Selection command 31, 34
front panel 23

G

Guard Tone Control command 31

H

handshake 29
hangup command 28
hangup delay 36
Hook Control command 28
HyperTerminal 15

I

inactivity timer 36
Inactivity Timer command 34
indicators 23, 46
Information Request command 28
initialization strings 26, 47
installation and setup 10–63
Internet addresses 63

K

K56flex protocol 6

L

LED indicators 23, 46
lightning protection 22
line connection 12
line feed character 36
LINE jack 22
Load Factory Settings command 31
local analog loopback test 58
local digital loopback test 60
Long Space Disconnect command 30
loopback tests 58–63

M

messages 39–63
Microsoft Fax 16
MNP 5 data compression 20, 35
MNP error correction 20, 34
Modem Port Flow Control command 33
Modem Reset command 30
Modulation Handshake command 29
Monitor Speaker Mode command 29
Monitor Speaker Volume command 28
Multi-Tech BBS 15, 62
Multi-Tech Internet addresses 63

N

New Zealand regulations 54
noise 51

O

on-hook/off-hook 28
online command mode 26

P

package contents 7
pause time for comma, setting 36
phone connection 12
PHONE jack 22
Plug and Play 6
Protocol Result Code command 34
Pulse Dialing command 29

R

rate, maximum data 37
Read Register Value command 29
reference materials 17
registering your product 61
regulatory compliance 50–63
related manuals 7
remote configuration 42–63
  escape character 36, 43
  escape sequence 35
remote digital loopback test 59
removing a modem from Windows 14
repairs 61
Repeat command 27
required equipment 10, 21
resetting the modem 30, 31
Result Code Format command 30
Result Code Options command 30
Result Code Selection command 30
result codes 26, 34, 39–63, 47
Result Codes Enable/Disable command 29
retrain 30
Return Online to Data Mode command 29
ringer equivalence number (REN) 50
rings, setting number of 36
ROM checksum 28
RS232 connection 22

S

S-registers 36–63
  reading 29
  S0 36
  S1 36
  S10 36
  S11 36
  S2 36
  S28 36
  S3 36
  S30 36
  S35 36
  S36 36
  S37 37
  S38 37
  S4 36
  S42 37
  S43 37
  S48 38
  S5 36
  S6 36
  S7 36
  S8 36
  S89 38
  S9 36, 43
  setting 29
safety 10
Select Maximum MNP Block Size command 32
Select Stored Configuration command 32
servicing your modem 51, 61

Set Register Value command 29
setup password 42
solving problems 46–63
Speaker Mode command 29
specifications, technical 55–63
speed
  data transmission 20
  fax transmission 21
  maximum 37
speed conversion (data buffer) 31, 33
standby mode delay time 38
Store Current Configuration command 32
Store Setup Password command 35

T

technical specifications 55–63
technical support 62, 63
telephone, connecting a 12, 22
telephone line 21, 22, 47
terminal mode 46, 59
testing the modem 32, 47
  loopback tests 58–63
Tone Dialing command 29
tones, dialing 36
Transmit Break command 33
troubleshooting 46–63

U

uninstalling a modem from Windows 14

V

V.22 mode 27
V.22bis Guard Tone Control command 31
V.25 data calling tone 34, 36
V.32 Auto Retrain command 30
V.32bis start-up auto mode, disabling 37
V.34 modulation, enabling 36
V.42 error correction 20, 34
V.42bis data compression 20, 35
V.54 tests 32, 58–63
View Numbers in Blacklist command 34

W

wait time for dial tone 36
warranty 20, 50, 61
Windows 95 13–63
  uninstalling a modem 14
Windows NT
  uninstalling a modem 14
World Wide Web 17

X

XON/XOFF Pass-Through command 34